



## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

[RTID: 0648-XV190]

#### Request for Information on Scope of Civil Space Situational Awareness Services

**AGENCY:** Office of Space Commerce, National Oceanic and Atmospheric Administration, Department of Commerce.

**ACTION:** Notice; request for information.

**SUMMARY:** The U.S. Department of Commerce (Department), via the Office of Space Commerce (OSC) in the National Oceanic and Atmospheric Administration (NOAA), requests additional input from interested parties on OSC's currently planned scope of basic safety services to be provided via the Traffic Management System for Space (TraCSS) program. This input will inform OSC's development of capabilities to share SSA data, information and services to space operators and the public.

**DATES:** Responses are due on or before *[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]*.

**ADDRESSES:** Interested individuals and organizations should submit written comments on issues addressed in this notification by the following method:

- By Email to: [space.commerce@noaa.gov](mailto:space.commerce@noaa.gov). Include the title of this Request for Information (RFI) in the subject line of the message.

*Instructions:* Response to this RFI is voluntary. Attachments will be accepted in plain text, Microsoft Word, or Adobe PDF formats only. Respondents need not reply to all questions listed. Each individual or institution is requested to submit only one response. All comments received are part of the public record and may be posted, without change, on a Federal website. All identifying information (*e.g.*, name, address) submitted voluntarily by the sender will be publicly accessible. OSC, therefore, requests that no

business proprietary information, copyrighted information, or personally identifiable information be submitted in response to this RFI. Please note that the U.S. Government will not pay for response preparation, or for the use of any information contained in the response.

**FOR FURTHER INFORMATION CONTACT:** John Dyer, Office of Space Commerce, (202) 482-4731; [John.Dyer@noaa.gov](mailto:John.Dyer@noaa.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Background**

NOAA's Office of Space Commerce (OSC) is exploring the scope of a basic safety service for space situational awareness (SSA) services of active satellites and debris in preparation of future OSC SSA products. As described in Space Policy Directive-3 (SPD-3) (<https://www.federalregister.gov/d/2018-13521>) and the 2021 United States Space Priorities Framework (<https://www.whitehouse.gov/wp-content/uploads/2021/12/United-States-Space-Priorities-Framework--December-1-2021.pdf>), OSC is charged providing basic SSA safety services to all space operators, including conjunction analysis and warning services and making those basic services free of direct user fees while supporting new opportunities for U.S. commercial and non-profit SSA services.

SPD-3 proposed these services be part of an "Open Architecture Data Repository" which OSC will now refer to as TraCSS. TraCSS will provide satellite tracking data and associated products and services to support all private and civil space satellite owner/operators (O/Os). TraCSS will ingest the various available data sources and data types for analysis to support the tracking of debris and space objects. The scope of the initial operating capability, the basic safety service, is the primary subject of interest of this RFI.

OSC greatly appreciated responses to prior RFIs, most recently from its RFI published on July 8, 2022 (

*14516/request-for-information-on-industry-needs-for-space-situational-awareness-data-and-value-added*). Since that time, in addition to closely reviewing those responses, OSC has concluded a Memorandum of Agreement with the Department of Defense, formalizing the organizations' relationship for basic SSA, space traffic management (STM), and coordination for civil and commercial entities. OSC also initiated a pilot project to provide spaceflight safety mission assurance to select spacecraft in the medium Earth orbit (MEO) and geostationary Earth orbit (GEO), partnering with the Department of Defense to award seven contracts to U.S. commercial space firms for space situational awareness data analysis.

With this additional insight, OSC has further refined its planned SSA program. OSC has defined its view of the core U.S. Government interests in the provision of basic SSA safety services, and based on that principle, has outlined its anticipated basic SSA safety services and the appropriate mix of commercial and governmental resources to provide those services with greater granularity.

In this RFI, OSC seeks public input broadly from the space community on OSC's definition of core U.S. Government interests in the provision of basic SSA safety services and its refined plan to meet those interests through the TraCSS, including from spacecraft operators, SSA data providers (current and prospective, ground and space-based), SSA analytic and value-added service providers, academia, nonprofit entities, space insurance providers, and the legal community.

## **II. Description of Basic Safety SSA Services**

OSC will provide basic SSA safety services through TraCSS to meet the core U.S. Government interest to further safety, stability, and sustainability in space and increase U.S. commercial leadership in space. Provision of these services is vital for the commercial growth of the American economy and to promote national security. These

services can help reconcile the growing use of orbital space with the effective management of this domain.

The scope of basic SSA safety services is limited to those necessary to maintain the safety, stability, and sustainability of the increasingly congested and contested space environment. Basic SSA safety services can include additional services that significantly increase the safety, stability, and sustainability of the space environment. However, OSC will also consider whether the provision of such services will negatively impact the U.S. SSA industry. The precise demarcation between these basic SSA safety services and other advanced services is driven by present SSA needs and market dynamics. Given the rapid acceleration of technological advances, OSC is committed to continue to observe changes in the marketplace and its underlying technologies, and consider how these developments, along with SSA service needs, might shift the demarcation between basic and advanced services as time goes on. Where a service is judged to be a “basic service,” OSC is also interested in whether the service should be provided by the government or should be purchased by the government from a commercial vendor and redistributed to TraCSS users.

The list of orbital safety services below derives from existing practices by the Department of Defense (DoD) and National Aeronautics and Space Administration (NASA), augmented by other services that commercial entities have previously proposed and responses to prior RFIs. “Included” indicates that a particular service is being considered for inclusion in the “free of fee” service through TraCSS that the OSC intends to provide to any satellite O/O willing to accept the tenets of participation (*e.g.*, the sharing of O/O predicted ephemerides). “Not Included” indicates that a particular service is currently not being considered to be provided by the OSC through TraCSS.

**(1) Satellite Attributes, Capabilities, Status, and Point of Contact (Included).**

To maintain a database of primary (protected) assets, which contains basic satellite

attributes (approximate dimensions, mass), indicates satellite trajectory change capabilities and current status, and includes 24/7/365 contact information to coordinate mitigation actions for conjunctions between active satellites.

**(2) Receipt and Sharing of Predictions O/Os Ephemerides (Included).** To receive predicted ephemerides from O/Os, store them in a manner that makes them available for download by other interested O/Os, and use them as the representation of the primary object for collision assessments (CA) screenings, risk assessment, and (when appropriate) mitigation planning.

**(3) Routine Collision Assessment (CA) Screening and Conjunction Data Message (CDM) Production (Included).** To screen primary objects against a robust satellite catalog, both routinely and on demand; and to generate CDMs for objects that violate the particular physical volumes used for the screening activity.

**(4) Special CA Screening and CDM Production (Included).** To perform an on-demand screening against a robust satellite catalog for a particular submitted ephemeris or set of ephemerides (usually for a confirmatory or speculative screening as part of maneuver planning).

**(5) Data Quality Evaluation (Included).** To perform a first-order evaluation of the orbit determination and propagation of the (usually secondary but in principle both) objects' state estimates and co-variances in order to determine whether these inputs are of sufficient quality to serve as a basis for a durable risk assessment calculation

**(6) Launch Collision Avoidance (COLA) Screenings (Included).** To perform timely screenings of a set of launch nominals against a robust satellite catalog in order to identify specific launch times during a launch window that would create unacceptably high collision risk and therefore should not be used.

**(7) O/O Ephemeris Generation and Curation with Covariance (Included).** To use O/O telemetry and on-board global positioning system state information, as well as

potentially other commercial tracking information, to generate a reliable predicted O/O ephemeris that includes covariance at each ephemeris point and incorporates planned maneuvers (and maneuver execution error).

**(8) Re-entry Management and Assessment (Included).** To perform re-entry forecasting and event pacing assistance for primary objects undergoing either natural decays or managed deorbits in order to assist the DoD in orchestrating the overall decay and decataloguing process.

**(9) Precision Probability of Collision Calculation (Included).** To include in each generated CDM a Probability of Collision (PC) calculation that uses more advanced approaches for determining the appropriate hard-body radius (HBR) and employs a calculation technique appropriate to the particular dynamics of the encounter.

**(10) Collision Consequence and Debris Production Potentials (Included).** To calculate, using an appropriate model, an estimate of the number of trackable debris fragments that would be generated if a particular conjunction were to result in a collision.

**(11) Conjunction Object Solution Improvements with Additional Tracking (Included).** To obtain additional tracking on the satellites involved in conjunctions of interest (typically the secondary objects), improve these objects' predicted states at the conjunction time of closest approach (TCA), and calculate higher-fidelity risk assessment metrics with this improved information.

**(12) Expected Tracking Determination (Included).** To generate a pass schedule and probabilities of detection for obtaining additional commercial tracking for conjunction-related objects, so that O/Os can infer the potential benefit of additional tracking and be able to schedule mitigation action decision points appropriately.

**(13) Risk Assessment Time History Plots (Included).** To produce time-history plots of conjunction risk assessment parameters of interest to allow assessment of conjunction event phasing and stability.

**(14) Space Weather Sensitivity (Included).** To provide warnings about space weather perturbative events and to assess the effects the perturbation-induced atmospheric density uncertainty will have on conjunction risk assessment parameters.

**(15) Fusion of CA Products (Not Included).** To combine CA products, such as CDMs or predicted ephemerides, from multiple providers into a single, higher-fidelity product that can then be used to enable CA risk assessment.

**(16) PC Variability (Not Included).** By considering bounding scale factors for the “true” size of the primary and secondary objects’ covariances, to generate a matrix of possible PC values to allow risk assessors to assign a more conservative “high-water-mark” PC value.

**(17) Additional Concierge Services (Not Included).** To provide on-call, personalized telephone support at all times by CA subject matter experts to assist O/Os with the interpretation of conjunction screening and risk assessment products.

**(18) Anomaly Resolution (Not Included).** To arrange for the obtaining and interpretation of anomaly resolution SSA products, such as point signatures (radar cross-section and/or photometry), time-series satellite signatures, and radar and optical imaging.

**(19) Design-time Assistance for Improved CA (Not Included).** During the satellite construction and mission design phase, to assist O/Os in the prudent selection of mission orbits, satellite construction decisions to produce favorable light pollution properties, and the proper build-out of effective O/O ephemeris construction and CA software and procedures.

**(20) Maneuver Trade Space (Not Included).** To assemble a visual aid that identifies particular maneuver times and intensities (and, for some maneuver types, durations) to achieve the desired level of conjunction risk reduction (for both the main conjunction and any other conjunctions that the particular maneuver might introduce).

**(21) Optimized Maneuver Recommendations (Not Included).** In addition to the parameters in service (20) above, to include satellite contact restrictions, spacecraft maneuverability limitations, and O/O optimality preferences to construct a recommended maneuver plan to mitigate the main conjunction and ensure against the creation of any serious derivative conjunctions.

**(22) Breakup Detection, Tracking, and Cataloguing (Not Included).** To commission routine surveillance tracking to detect satellite break-ups; and upon the detection of a break-up, to increase supplementary surveillance tracking to collect break-up uncorrelated tracks (UCT), perform UCT processing, obtain dedicated tracking on new candidate objects, and suggest/perform cataloging actions for stable candidates for which the country of origin can be established.

**(23) Maneuver Detection and Processing (Not Included).** To commission heightened surveillance tracking on maneuverable objects; execute maneuver detection algorithms against the tracking obtained from such heightened surveillance; and for objects for which maneuvers are detected, perform appropriate maneuver processing to create a durable post-maneuver state estimate.

### **III. Questions to Inform Development of Basic SSA Safety Services**

OSC seeks responses to three categories of questions, and invites any member of the public to provide input:

- A. Scope of Proposed Basic SSA Safety Services;
- B. Impacts of Proposed Basic SSA Safety Services on Commercial SSA Providers;
- C. Tenets of Participation and Receipt of Basic SSA Safety Services; and
- D. General Feedback.

Respondents are encouraged to explain how the capabilities to be provided by OSC's TraCSS can be structured to enable a competitive and burgeoning U.S. commercial



space sector. Responses may also explain how the U.S. Government can work with industry and international partners in the development of open, transparent, and credible international standards, policies, and practices that will aid in the provision of these basic SSA safety services.

#### **A. Scope of Proposed Basic SSA Safety Services**

OSC seeks to clearly define and communicate the scope of basic safety SSA services to enable industry innovation of advanced services. OSC seeks responses regarding which SSA services should be included as part of TraCSS. OSC understands that the need to provide certain services through TraCSS may change over time. Similarly, some services may be necessary to include in the TraCSS initial offering only and others should be added in the future. For each of the services discussed above, OSC is seeking public input about whether the service should be included in TraCSS, and if so, whether it should be part of the initial offering or added in the future. Additionally, OSC seeks input on whether the services should be developed by the government or purchased from commercial vendors and redistributed. Furthermore, OSC invites comment on the following questions for each of the services:

- Does the proposed basic safety SSA service provide sufficient data to allow ongoing operations of orbital assets at a level equal to or beyond that currently provided by the DoD?
- What proposed basic safety SSA services are essential to your ongoing operations? If the U.S. Government were to prioritize the delivery of individual services as part of TraCSS, which ones should be provided soonest?
- What, if any, additional capabilities beyond those currently provided by the DoD should be included in the TraCSS?

- Are there any additional capabilities not listed that should be included in the basic SSA safety service to provide a baseline level of safety for owners and operators?
- Where applicable, at what level or how often should the service be performed? For example, comments may address how often routine collision assessments should be conducted as part of the basic SSA safety service. DoD currently provides these assessments three times a day. How often should OSC's basic safety SSA service provide these assessments?

## **B. Impacts of Proposed Basic SSA Safety Services on Commercial SSA Providers**

OSC's provision of basic SSA safety services through TraCSS is intended to advance safety, stability, and sustainability in space and help the domestic commercial SSA industry grow. OSC is evaluating the potential impacts that the basic SSA safety services provided through TraCSS may have on the commercial SSA industry. OSC is seeking public input on whether there are any concerns with respect to commercial SSA providers with their own services or other value-added providers that may rely on governmental SSA basic safety services. Furthermore, OSC invites comment on the following questions:

- Are any of the basic SSA safety services readily available from the current U.S. SSA industry? If so, is the service affordable to owners and operators of spacecraft?
- For commercial SSA service providers, does the current SSA capability offered by the DoD have any impacts on your current or future product offerings?
- For commercial SSA service providers, do any of the basic SSA safety services identified for inclusion in TraCSS have any impacts or implications on your current or future product offerings? If so, which services proposed to be part of TraCSS would have an impact on your offerings and why?

- For O/Os, are any of the basic SSA safety services identified for inclusion in TraCSS duplicative of what O/Os of spacecraft are already responsible for obtaining or providing?

- Are there unique advantages to the government purchasing and redistributing certain commercial services rather than leaving these to the commercial marketplace?

### **C. Tenets of Participation and Receipt of Basic SSA Safety Services**

OSC is seeking public input regarding what should be required to receive “free of fee” basic SSA safety services through TraCSS. OSC recognizes that certain basic SSA safety services should be made publicly available. For example, space objects from a current DoD catalog that are not sensitive to national security are currently made accessible to the public through the *Space-Track.org* website. OSC also recognizes that other basic SSA safety services should be available to all owners and operators. In response to previous RFIs, some comments suggested that OSC require owners and operators to provide operational information or act in good faith in response to the basic SSA safety services in order to participate in TraCSS. OSC also invites comment on the following questions:

- Which basic SSA safety services identified for inclusion in TraCSS should be made publicly available?

- What, if any, information should owners and operators of spacecraft be required to provide to OSC to participate in TraCSS?

- What, if any, actions should owners and operators agree to take to participate in TraCSS as part of the tenets of participation?

- What should happen when owners or operators fail to provide the relevant information to OSC or fail to take actions consistent with the tenets of participation?

### **D. General Feedback**

OSC welcomes feedback about any other related topics. For example, are there any matters not discussed above that OSC should or must consider before it provides basic SSA safety services through TraCSS?

#### **IV. How to Submit Your Response**

To facilitate review of your responses, please reference the subject of the RFI in your response. You may respond to some or all of the topic areas covered in the RFI, and you can suggest other factors or relevant questions. You may also include links to online material or interactive presentations. If including data sets, please make the data available in a downloadable, machine-readable format with accompanying metadata.

Please note that this is an RFI only. In accordance with the implementing regulations of the Paperwork Reduction Act of 1995 (PRA), specifically 5 CFR 1320.3(h)(4), this general solicitation is exempt from the PRA. Facts or opinions submitted in response to general solicitations of comments from the public, published in the **Federal Register** or other publications, regardless of the form or format thereof, provided that no person is required to supply specific information pertaining to the commenter, other than that necessary for self-identification, as a condition of the agency's full consideration, are not generally considered information collections and therefore not subject to the PRA.

This RFI is issued solely for information and planning purposes; it does not constitute a request for proposals, applications, proposal abstracts, or quotations. This RFI does not commit the U.S. Government to contract for any supplies or services or make a grant award. Further, we are not seeking proposals through this RFI and will not accept unsolicited proposals. Choosing not to respond to this RFI does not preclude participation in any future procurement, if conducted.

Dated: January 23, 2023.

**Richard DalBello,**

*Director, Office of Space Commerce,*

*National Oceanic and Atmospheric Administration.*

[FR Doc. 2023-01556 Filed: 1/25/2023 8:45 am; Publication Date: 1/26/2023]